South Lake Worth Inlet to Boca Raton Inlet Segment

242. South Lake Worth Inlet. The recommended plan for South Lake Worth Inlet requires the construction, operation and maintenance of a new sand transfer plant to be located north of the inlet with one discharge point located approximately 2,000 feet south of the south jetty. This system would be designed for a target bypassing rate of about 120,000 cubic yards per year. The design would be similar to the Lake Worth Inlet sand transfer plant and would similarly be determined within a Feature Design Memorandum (FDM) during PED studies.

243. Ocean Ridge. The 1.35 mile beach restoration and periodic nourishment project component located between DEP monuments R-152 and R-159 is authorized (1962), but not constructed. This project is scheduled for construction by Palm Beach County during 1996. The optimal berm width is 60 feet at elevation +9.0 feet NGVD and slopes of 1:10 berm to MLW and 1:30 from MLW to existing bottom. The initial design volume is 770,000 cubic yards and includes 8 years of advance nourishment. The annual advance nourishment is 62,600 cubic yards. Two nearshore berm sites, however, have been recommended as potential dredged material disposal sites. Extension of federal participation from 10 years to 50 years is recommended.

244. Delray Beach. The recommended 2.7 mile beach restoration and periodic nourishment project component located between DEP monuments R-175 and R-188 is authorized and constructed. This project is recommended for modification with an additional 20 feet optimal berm width at elevation +9.0 feet NGVD and slopes of 1:20 berm to MLW and 1:30 from MLW to existing bottom. The recommended additional design volume is 155,300 cubic yards with a 290 foot equilibrium toe of fill. No hardgrounds exist in the vicinity of this project so no mitigation will be required. Although this project component is a considerable distance from either inlet, an extensive nearshore berm site offshore of this project componet is recommended as a potential dredged material disposal site. The Delray project has been extended to 50 years of Federal participation by Assistant Secretary of Army (Civil Works) under Section 934.

245. Highland Beach. The 3.4 mile beach restoration and periodic nourishment project component located between DEP monuments R-188 and R-205 is a modification to the authorized (1962) periodic nourishment project. It would fill in a gap between two authorized projects for lessening end losses. The optimal berm width of this project component is 120 feet at elevation +9.0 feet NGVD, and slopes of 1:10 berm to MLW and 1:30 from MLW to existing bottom. The initial project design volume is 1,017,450 cubic yards with a 350 foot toe of fill. The recommended renourishment interval is 7 years. The distance to the equilibrium toe of fill, including initial fill plus advance nourishment, is 450 feet with a total volume of 1,900,430 cubic yards. No hardground mitigation has been identified for this project component. One nearshore berm site has been identified offshore of this

project coastline. Extension of Federal participation from 10 years to 50 years is recommended.

246. Boca Raton. The 1.65 mile beach restoration and periodic nourishment project component located between DEP monuments R-205 and R-213 is authorized and constructed. Extension of Federal participation from 10 years to 50 years is recommended. Another recommended modification to this project component is a nearshore berm site as an alternative maintenance dredged material disposal site.

Other Palm Beach County Project Segment Alternatives.

247. As previously discussed, specific recommendations for the 1.9 miles of northern the Palm Beach County shoreline, north of Jupiter Inlet, will be addressed in the Region IV COFS study. In addition to the above specific project components, periodic nourishment as necessary and justified is an existing project feature for Palm Beach County, Florida. No modification of this project feature is recommended for the economic life of the project. Dune grassing, as necessary and justified is also recommended for the Palm Beach County shoreline as a cost effective project feature.

Boca Raton Inlet (Palm Beach County) to Hillsboro Inlet (Broward County) Segment

BROWARD COUNTY

248. Deerfield Beach/Hillsboro Beach (Segment I). The 4.4 mile beach restoration and periodic nourishment project segment located between DEP monuments R-1 and R-24 is authorized, but not constructed. The optimal berm width is 30 feet at elevation +9.0 feet NGVD and slopes of 1:10 berm to MLW and 1:30 from MLW to existing bottom. The initial project design volume is 746,700 cubic yards with a 300 ft toe of fill. The recommended renourishment interval is 7 years. The distance to the equilibrium toe of fill, including initial fill plus advance nourishment, is 406 feet with a total volume of 1,055,820 cubic yards. Mitigation for approximately 4.65 acres of hardground may be necessary in association with this project segment. A nearshore berm dredged material disposal site has been identified and recommended offshore this project shoreline. It is also recommended that Federal participation in this project segment be extended from 10 years to the economic life of the project.

249. Hillsboro Inlet. Navigation improvements are being considered for the outer channel at this inlet to provide additional advanced maintenance for the entrance channel as part of the Hillsboro Inlet, Florida, Federal navigation project. Two alternatives are being evaluated. One alternative is as designed and contained within a permit request by the sponsor. The other is an alternative designed by Jacksonville District. The recommendations for this navigation project will be addressed in a

separate navigation report which will address related potential impacts to the adjacent shorelines.

Hillsboro Inlet to Port Everglades Inlet Segment (Segment II)

250. Pompano/Lauderdale-By-The-Sea. The 5.2 mile beach restoration and periodic nourishment project component located between DEP monuments R-24 and R-53 is authorized and constructed. This project is recommended for modification with an additional 35 feet optimal berm width at elevation +9.0 feet NGVD and slopes of 1:20 berm to MLW and 1:30 from MLW to existing bottom. The recommended additional design volume is 600,000 cubic yards with a resulting equilibrium toe of fill of 365 feet. Mitigation for approximately 12.25 acres of hardground may be necessary in association with this project segment modification. A nearshore berm dredged material disposal site has been identified and recommended off this project shoreline. Extension of Federal participation in this project segment from 10 years to the economic life of the project is also recommended.

251. Fort Lauderdale. This 4.0 mile project segment area located between DEP monuments R-53 to R-74 is authorized for periodic nourishment. A beach restoration and periodic nourishment project component modification is recommended. The recommended optimal berm width is 25 feet at elevation +9.0 feet NGVD and slopes of 1:10 berm to MLW and 1:30 from MLW to existing bottom. The initial project design volume is 466,700 cubic yards. The recommended renourishment interval is 6 years. The distance to the equilibrium toe of fill, including initial fill plus advance nourishment, is 500 ft with a total volume of 858,193 cubic yards. Federal participation to the 50 year economic life of this project component is recommended. Mitigation for approximately 18 acres of hardground impact may be necessary in association with this project component. Nearshore berms are not feasible in association with this project component due to the presence of nearshore hardgrounds.

Port Everglades Inlet (Broward County) to Bakers Haulover Inlet (Dade County)

Broward County (Segment III)

252. Segment III of the Broward County project includes two authorized beach restoration and periodic nourishment project sections, J. U. Lloyd and Hollywood/Hallandale. Extension of Federal participation to the 50 year economic life of these projects was approved by Assistant Secretary of Army (Civil Works) under Section 934 in September 1992.

253. J.U. Lloyd. The 2.3 mile beach restoration and periodic nourishment project component located between DEP monuments R-86 and R-98 is authorized and constructed. The optimal berm width in the re-analysis of this project remains at 100 feet at elevation +10 feet NGVD and slopes of 1:15 berm to MLW and 1:30 from

MLW to existing bottom. The design volume, including initial fill and advance nourishment is 1,032,000 cubic yards. The renourishment interval is 6 years. The only recommended modification to this project segment is a nearshore berm site as an alternative maintenance dredged material disposal site.

254. Hollywood/Hallandale. The 5.25 mile beach fill project located between DEP monuments R-101 and R-128 is authorized and constructed. This project is recommended for modification with an additional 50 feet optimal berm width at elevation +7.0 feet NGVD and slopes of 1:15 berm to MLW and 1:40 from MLW to existing bottom. The recommended additional design volume is 720,000 cubic yards resulting in a project equilibrium toe of fill of 230 feet. The renourishment interval is 6 years. No hardgrounds exist in the immediate vicinity of this project so no mitigation will be required. A nearshore berm dredged material disposal site has been identified offshore of this project segment.

255. Dania. This 0.6 mile reach of beach is presently authorized for periodic nourishment. A modification to a beach restoration and periodic nourishment project is recommended for this project segment component located between DEP monuments R-98 and R-101. Initial restoration of the beach at Dania would fill in the gap between J.U. Lloyd and Hollywood/Hallandale. Due to the small project length, the fill would be designed as a transition between these two all ready constructed projects and help reduce end losses in Segment III.

256. The optimal berm width transition between J. U. Lloyd and Hollywood/Hallandale is 125 feet, on the average (i.e., between 100 and 150 feet), with a transition berm height between elevation +10.0 feet and +7.0 NGVD and slopes of 1:15 berm to MLW and 1:40 from MLW to existing bottom. The initial design volume is 208,300 cubic yards. The recommended renourishment interval is 6 years. The distance to the equilibrium toe of fill, including initial fill plus advance nourishment, is 220 feet with a total volume of 460,840 cubic yards. Federal participation in the economic life of this transition project component is recommended.

Other Broward County Project Segments.

257. In addition to the above specific project segments, periodic nourishment as necessary and justified is an existing project feature to the Broward County, Florida project. No change in this project feature is recommended at this time. Dune grassing, as necessary and justified is also recommended for the Broward County shoreline as a cost effective project feature.

DADE COUNTY

258. Golden Beach. It is recommended that the Dade County, Florida, Beach Erosion Control and Hurricane Protection Project be modified to include initial restoration and periodic nourishment for the 1.2 mile shoreline located between DEP monuments R-1 and R-7 in Dade County. This project component would fill in a gap between the Dade County and Broward County authorized projects, decreasing project end losses.

259. The optimal berm width in the analysis of this project is 100 feet at elevation +8.2 feet NGVD and slopes of 1:10 berm to MLW and 1:30 from MLW to existing bottom. The initial project design volume is 311,000 cubic yards with a 260 foot toe of fill. The recommended renourishment interval is 6 years. The distance to the recommended equilibrium toe of fill, including initial fill plus advance nourishment is 832 feet with a total volume of 534,660 cubic yards. Mitigation for approximately 5.25 acres of hardground impact may be necessary in association with this project segment. One nearshore berm site has been identified as an alternative maintenance dredged material disposal site.

260. Sunny Isles. The 2.65 mile beach fill project segment component located between DEP monuments R-7 and R-20 is authorized and constructed. This segment of the Dade County, Florida project is recommended for modification with an additional 20 feet optimal berm width at elevation +8.2 feet NGVD and slopes of 1:10 berm to MLW and 1:30 from MLW to existing bottom. The recommended additional design volume is 146,700 cubic yards with an additional 200 foot toe of fill extension. No hardgrounds exist in the vicinity of this project so no mitigation will be required. One nearshore berm site has been identified as an alternative maintenance dredged material disposal site.

Bakers Haulover Inlet to Government Cut:

261. Bal Harbour, Surfside, Miami Beach. The 9.3 mile beach fill project segment located between DEP monuments R-27 and R-74 is authorized and constructed. The only recommended modifications to this project segment are the addition of four nearshore berm sites that have been identified as an alternative maintenance dredged material disposal sites.

262. Government Cut. As identified in a previous DM, a sand tightening of Government Cut has been recommended. This sand tightening will help reduce end losses to the southern portion of the Miami Beach project segment and further reduce Government Cut maintenance dredging requirements. The sand tightening project will be undertaken as a separate project modification.

Project Segments South of Government Cut:

263. Virginia Key/Northern Key Biscayne. Shore protection of Virginia Key and northern Key Biscayne was authorized by the River and Harbor Act of 1962 (PL 87-874). Construction of the 1.8 mile Virginia Key shoreline and 1.9 mile northern Key Biscayne shoreline was completed in 1969. The Virginia Key shoreline was renourished in 1972 and 13 groins were also constructed. This project was deauthorized in 1990. As documented in the 1992 Rehabilitation Report following Hurricane Andrew, in August 1992, the Virginia Key project was found to be performing well to date. No project segment modification is recommended for Virginia Key at this time.

264. Key Biscayne. The 2.3 mile beach fill project located between DEP monuments R-101 and R-113 was initially constructed in 1985 under the authority of Section 103 of the 1962 River and Harbor Act. Nourishment for 50 years was authorized, however, the Federal limit of $1,000,000 under Section 103 has been met. It is recommended that the Dade County project be modified to incorporate this project segment so that Federal participation in periodic nourishment can be continued through the economic life of this project segment. An additional optimal berm width of 10 feet at elevation +8.2 feet NGVD and slopes of 1:10 berm to MLW and 1:30 from MLW to existing bottom is recommended. The additional project design volume is 106,660 cubic yards. The recommended renourishment interval is 7 years.

Other Dade County Project Segments:

265. In addition to the above specific project segment modifications, periodic nourishment as necessary and justified is recommended for all Atlantic Ocean shorelines within Dade County for the economic life of each project segment. Dune grassing, as necessary and justified is also recommended for the Dade County shoreline as a cost effective project feature.

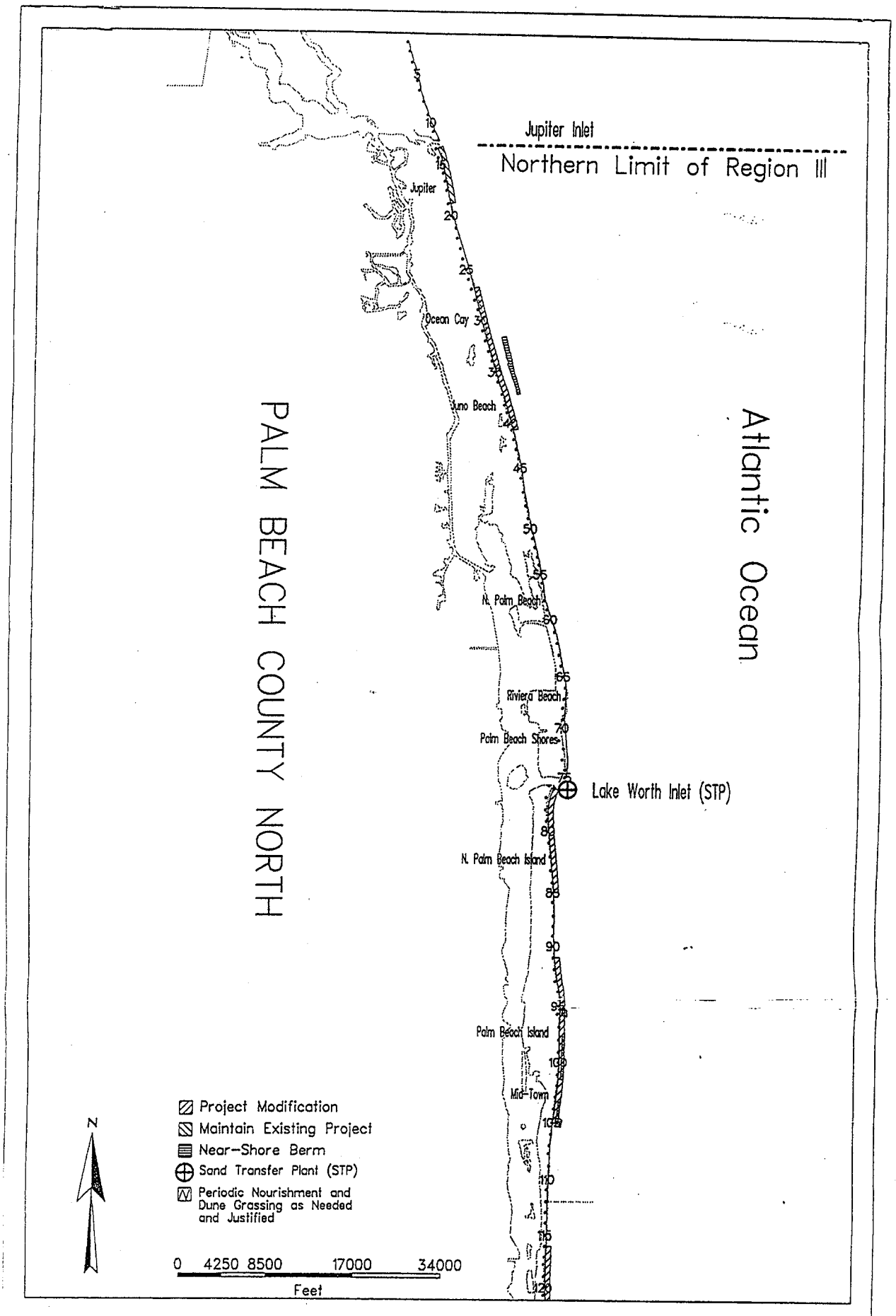

Figure 2. Palm Beach County Project Alternatives, North

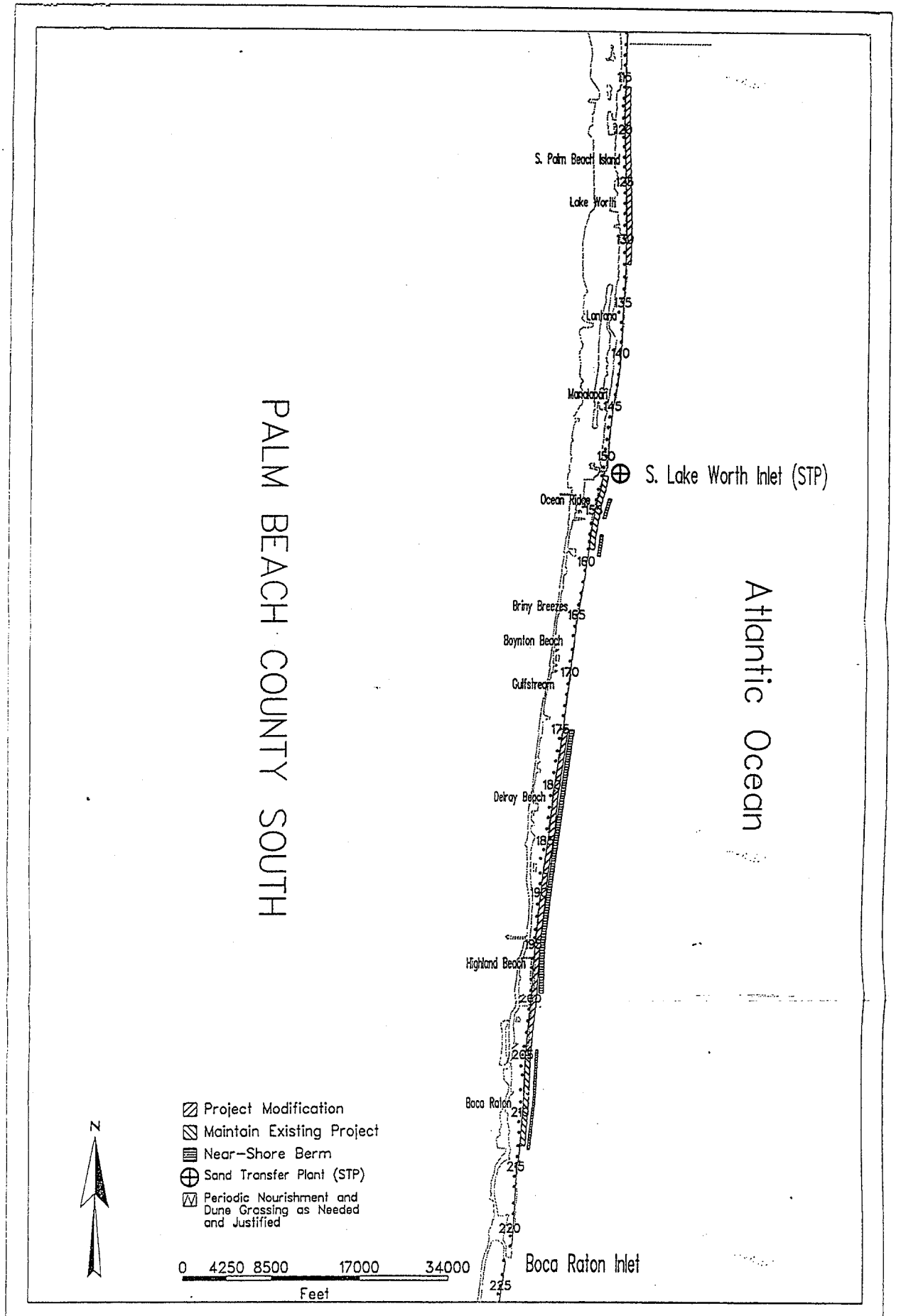

Figure 3. Palm Beach County Project Alternatives, South

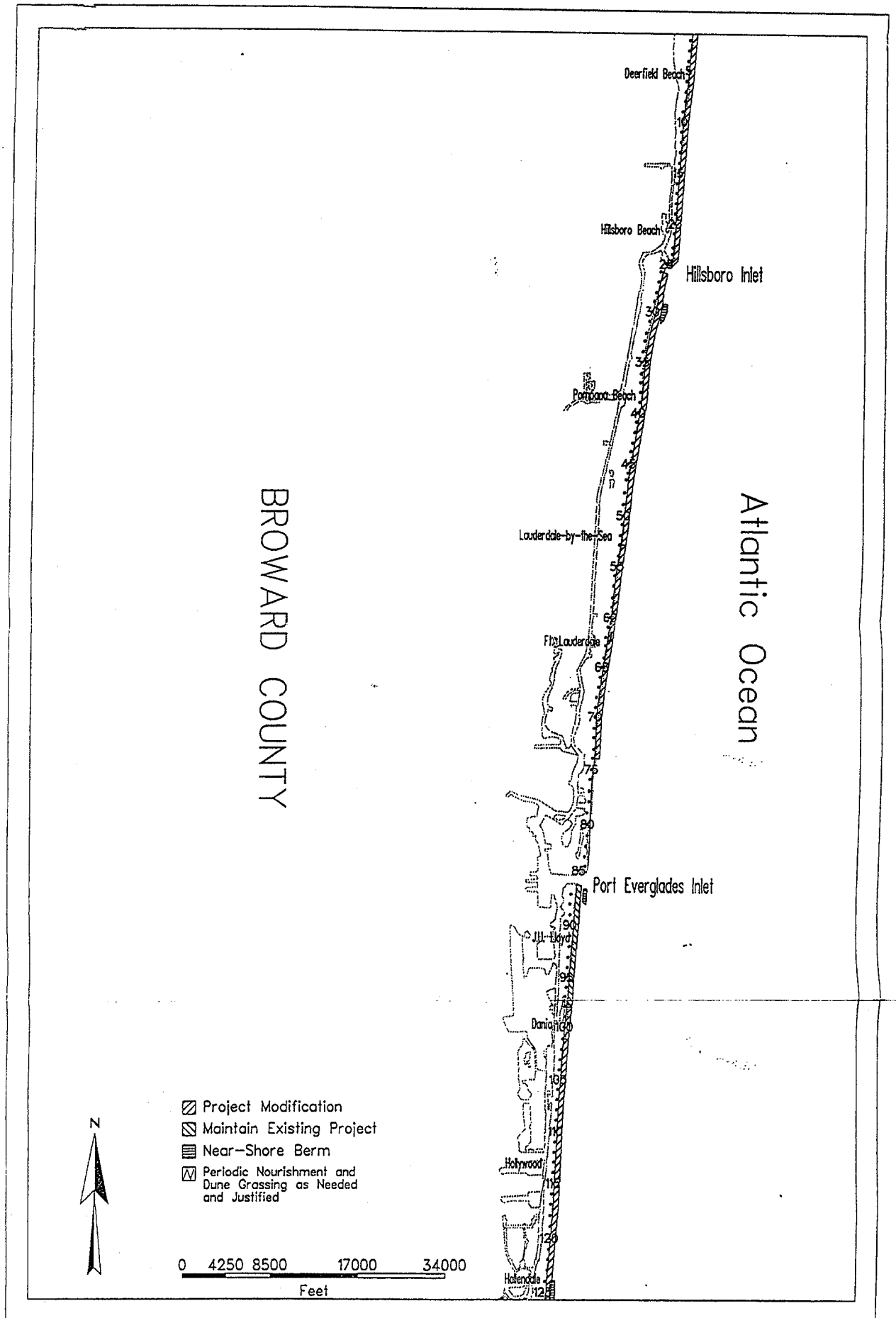

Figure 4. Broward County Project Alternatives

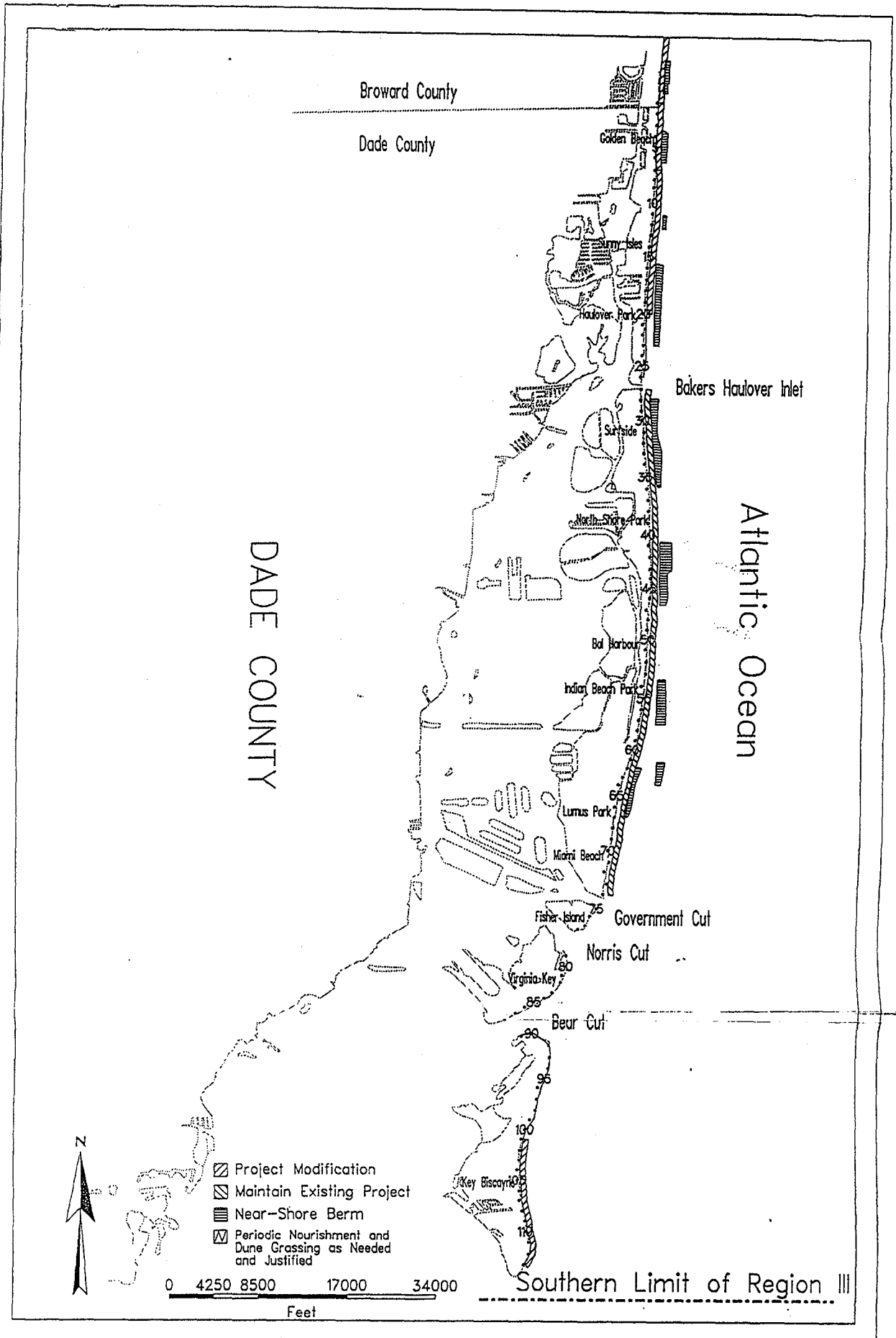

Figure 5. Dade County Project Alternatives

October 5, 1995

Planning Division
Environmental Branch

Mr. Craig Johnson
Field Supervisor
U.S. Fish and Wildlife Service
Post Office Box 2676
Vero Beach, Florida 32961-2676

Dear Mr. Johnson:

This is in reference to the Coast of Florida Erosion and Storm Effects Study.

Enclosed is the Biological Assessment pursuant to Section 7(a) of the Endangered Species Act concerning potential impacts to sea turtles. The U.S. Army Corps of Engineers has determined that the planned actions may affect sea turtle nesting. Therefore, we are requesting that formal consultation with the Service be initiated to address potential impacts the project may have on sea turtles.

Please provide your Biological Opinion as specified in Section 7(b)(1) of the Endangered Species Act. If you have any questions or need any further information, you can contact Mr. Mike Dupes at 904-232-1689.

Sincerely,

A. J. Salem
Chief, Planning Division

Enclosure

ENDANGERED SPECIES ACT
BIOLOGICAL ASSESSMENT
COAST OF FLORIDA EROSION AND STORM EFFECTS STUDY
REGION III

1. PROJECT AUTHORITY: The Coast of Florida Erosion and Storm Effects Study (COFS) is being conducted in response to Section 104, Public Law (PL) 98-360, dated July 16, 1984, and a resolution date August 8, 1984, by the Committee on Public Works and Transportation, of the U.S. House of Representatives.

2. LOCATION: The study area is located along the Atlantic Ocean shoreline of Palm Beach, Broward, and Dade Counties on the lower southeast coast of Florida (Figure 1). Palm Beach County is the northernmost county in the study area followed by Broward County and then Dade County at the southern end. The northern limit is Jupiter Inlet and is about 80 miles north of Miami Beach. The southern limit of the study area is the southern tip of Key Biscayne in Dade County. The study area comprises approximately 88 miles of Atlantic Ocean shoreline.

3. DESCRIPTION OF THE PROPOSED ACTION: The COFS is a multi-year, phased regional feasibility study examining the entire developed east coast ocean shoreline and west coast gulf shoreline. The objective of the study is to develop a comprehensive understanding of the coastal processes and associated environmental resources to help in the development of enhanced shore protection projects while reducing environmental impacts. The current region being studied (Region III), which includes Dade, Broward and Palm Beach Counties, is nearing completion. Alternative recommendations for 21 project segment modifications have been identified through the COFS. These modifications include initial beach restoration for four new sites, (Fort Lauderdale, Highland Beach, Dania and Golden Beach) and improvements at two existing sand transfer plants (Lake Worth Inlet and South Lake Worth Inlet) in addition to modifications at other existing authorized beach nourishment sites. New nearshore berm disposal sites have also been identified as project components adjacent to several project locations. Alternative sand sources for beach renourishment include offshore borrow areas, upland sand sources and aragonite (or other calcium carbonate sands) from the Bahama Bank. The location of identified hardground areas have been taken into consideration by scaling back recommended project footprints and carefully locating nearshore berms to reduce and/or avoid associated impacts to hardground resources. The recommended plans are discussed in the Draft Feasibility Report for the study, dated May 1995. A preliminary review copy of this report, which includes a Draft Environmental Impact Statement has been provided to the U.S. Fish and Wildlife Service Field Office in Vero Beach, Florida.

4. REFERENCES: Several Biological Assessments and Biological Opinions have been prepared for previous shore protection projects in the Region III study area. These

documents are listed in the reference section and are incorporated into this Biological Assessment by reference.

5. LISTED SPECIES WHICH MAY BE AFFECTED: Listed species which may occur in the vicinity of the study area and are under the jurisdiction of the U.S. Fish and Wildlife Service are: loggerhead sea turtle (*Caretta caretta*, T), green sea turtle (*Chelonia mydas*, E), leatherback sea turtle (*Dermochelys coriacea*, E), hawksbill sea turtle (*Eretmochelys imbricata*, E), and the West Indian manatee (*Trichecus manatus*, E).

6. DISCUSSION OF POTENTIAL IMPACTS TO LISTED SPECIES:

The potential impacts to sea turtles and manatees that can be associated with beach nourishment projects have been discussed at length in the Biological Assessments and Biological Opinions referenced above and are incorporated here by reference. The following addresses potential effects to sea turtles if calcium carbonate sand from the Bahamas is used.

Few beaches in Florida have been nourished with sand imported from the Bahamas. Fisher Island, in Miami, Florida was renourished with commercially mined aragonite in 1991. The impact of nourishment in relation to sea turtle nesting on the beach at Fisher Island has been part of a three year study by the Sea Turtle Laboratory at the Rosenstiel School of Marine and Atmospheric Science. There were a total of six natural[1] nests laid in 1991 on Fisher Island beach and a total of 15 in 1992 (Lutz et al. 1991, 1992).

It has been noted that turtles nest in various types of sands, both calcareous types (including shell and aragonite) and silica types (quartz sands). Quartz sand has a hardness of 7.0 on the Mohs scale, while aragonite ranges near 4.0 (Campbell et al. 1984). The aragonite sand is physically spherical to ellipsoidal in shape and is more dense than native sand. The mean grain size ranges from 0.25 mm to 0.29 mm and is moderately sorted (U. S. Army Corps of Engineers 1995). The increased density and shape of the aragonite tend to make it behave as a larger grain sized material. Aragonite sand has a lower silt/clay content than natural offshore borrow sources. Aragonite would tend to be more stable than native Florida sands because of its spherical shape and higher specific gravity. Aragonite has essentially no material finer than 200 microns and are well sorted with peaks at 300 to 500 microns (Wanless 1983). Because of the small amount of fines, the use of aragonite in beach nourishment is expected to reduce turbidity-related impacts, both in the nearshore zone and near the offshore reefs (Coastal Planning & Engineering 1994).

In addition to the monitoring of the natural nests in the Fisher Island Study, nests from Juno Beach, Jupiter, Florida, were relocated and monitored at two hatcheries, one filled with aragonite and the other filled with Florida sand. The hatcheries were located

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[1] "Natural" nests refers to nests that were left on the beach undisturbed, i.e. unrelocated nests.

approximately 75 feet from the shore on the east side of the renourished Fisher Island beach (Lutz et al. 1991). First year results revealed that aragonite sand on average is 2°C cooler than Florida silicate, significantly extending incubation times by 5 days and quite possibly altering natural sex ratios (Lutz et al. 1991). This temperature difference was also noted in the 1992 study. The Fisher Island Study showed no significant differences in hatchling size or hatching success of hatchlings between aragonite and Florida sand nests. The 1992 study revealed similar results as the 1991 study.

While sea turtles do successfully nest in aragonite sands, it is possible that the rate of success (portion of nests to total crawls) would be different from that in native sand. Because of the cooler temperatures found in aragonite, this may affect incubation time and could alter hatchling sex ratios. A 2°C change may lower the temperature below the pivotal point, therefore potentially causing more males than originally expected (Mrosovsky and Yntema 1980). This aspect should be studied carefully in the future. The U.S. Army Corps of Engineers is developing a study to determine the effects of using calcium carbonate sands from the Bahamas on Florida beaches. The study would include the construction of a test beach with Bahamian sand to monitor the physical properties and effects, as well as, effects on sea turtles and other environmental effects. The study is being coordinated with the State of Florida Department of Environmental Protection (FDEP) and the U.S. Fish and Wildlife Service (USFWS).

A test hatchery has been installed by Dade County in cooperation with the Corps Waterways Experiment Station. The purpose of the test hatchery is to compare physical characteristics, hatching success, and sex ratios for nests in aragonite and mixed sands. Results from the 1995 nesting season should be available around February 1996.

Although Bahamian sand is being considered as a potential source of sand for the Coast of Florida Study, this material will not be used until the appropriate studies have been completed and its use approved by the State and the USFWS.

7. EFFORTS TO ELIMINATE POTENTIAL IMPACTS:

Efforts to eliminate of significantly reduce the potential impacts associated with beach nourishment activities will be addressed by implementing the following actions:

a. Construction activities will be kept under surveillance, management, and control to minimize interference with, disturbance of, or damage to wildlife resources. Prior to the commencement of construction the contractor will be required to instruct all personnel associated with the project that endangered species could be in the area, the need to avoid collisions with them, and the civil and criminal penalties for harming, harassing or killing them.

b. Construction access and staging areas along the beach will be identified in the contract plans and specifications. Contractor vehicles, construction equipment and storage facilities

will be required to stay within the identified construction area.

c. Precautions will be taken during construction activities to insure the safety of the manatee. To insure the contractor and his personnel are aware of the potential presence of the manatee in the project area, their endangered status, and the need for precautionary measures, the contract specifications will include the standard protection clauses concerning manatees. All small vessels associated with the project will be required to operate at "no wake" speeds at all times while in shallow water, or channels, where the draft of the vessel provides less than three feet clearance from the bottom. Boats used to transport personnel shall be shallow draft vessels, preferably of the light-displacement category, where navigational safety permits. Vessels transporting personnel between the landing and any work boat shall follow routes of deep water to the extent possible. The contractor shall be held responsible for any manatee harmed, harassed, or killed as a result of the construction of the project. If a manatee is sighted within a hundred yards of the dredging area, appropriate safeguards will be taken, including suspension of dredging, if necessary, to avoid injury to manatees.

d. Efforts to eliminate or significantly reduce potential impacts to sea turtles will be addressed by the following:

(1) If construction occurs during any part of the sea turtle nesting season, a nest survey and relocation program will be implemented within the identified construction area. Nest relocation activities shall begin 65 days prior to construction activities which occur within the nesting, or by the first day of the season, whichever is later. In past USFWS Biological Opinions (within the Region III study area), the relocation timing and requirements have differed depending on the nesting density of the beach, recreational use and maintenance operations on the beach and existing relocation plans. The timing and requirements for relocation for each renourishment and/or construction activity will be determined during separate Section 7 consultations with the USFWS.

(2) Nest surveys and relocations will be conducted by personnel with prior experience and training in nest survey and relocation procedures, and with a valid Florida Department of Environmental Protection (FDEP) permit. Nests will be relocated between sunrise and 10 a.m. each day. All nests located and determined to be endangered by construction activities will be relocated to a nearby self release hatchery or a safer location on the beach.

(3) Immediately following completion of beach nourishment, cone penetrometer readings will be taken on the beach as previously described. Should the beach be impenetrable or the average cone index unit (cpu) exceed 500 cpu, the beach will be tilled to a depth of 36 inches (90 cm).

(4) The nourished beach will be monitored for escarpment formation. If an escarpment develops which exceeds 18 inches (45 cm) in height extends for more than 100

feet (30 m) and exceeds 500 cpu, it will be graded to a more accessible slope prior to the next turtle nesting season.

(5) If construction occurs during the sea turtle nesting season, measures will be taken to reduce beach lighting during nighttime operations. This will include eliminating lighting to an amount necessary for safe operation sand safety of personnel, and shall incorporate reduced wattage, downlights, and/or screens to minimize illumination of the beach and nearshore waters. Lighting on offshore equipment, including the dredge, shall be minimized through reduction, shielding, lowering, and appropriate placement of lights to avoid excessive illumination of the water, while meeting all Coast Guard and OSHA requirements. Shielded low pressure sodium vapor lights is recommended for all lights on the beach or offshore equipment that cannot be eliminated.

e. Any incident involving the death or injury of any listed threatened or endangered species described in this Biological Assessment shall be immediately reported to the U.S. Army Corps of Engineers (Jacksonville) and the U.S. Fish and Wildlife Service (Vero Beach).

8. EFFECT DETERMINATION: Because of the nature of the work and the precautions to be taken as described in the previous section, the U.S. Army Corps of Engineers has determined that the proposed action will have no effect on the manatee. Because of the potential effects associated with nesting sea turtles, sea turtle nests, and hatchlings, we have determined that the proposed action may affect sea turtles.

REFERENCES

Previous Biological Assessments prepared by the U. S. Army Corps of Engineers.

Dade County Shore Protection Project, Sunny Isles and Miami Beach Segments - April 23, 1993.

Dade County Shore Protection Project, Surfside and South Miami Beach Segments - December 21, 1993.

Broward County Shore Protection Study, Segment II, Section 934 Study - July 26, 1991.

Broward County Shore Protection Project, Hollywood/Hallandale Renourishment - February 8, 1990.

Palm Beach County Shore Protection Project, Ocean Ridge - January 21, 1994.

Previous Biological Opinions Prepared by the U.S. Fish and Wildlife Service.

Dade County Shore Protection Project, Sunny Isles and Miami Beach Segments - August 11, 1993, amended July 28, 1994.

Dade County Shore Protection Project, Surfside and South Miami Beach Segments - April 15, 1994.

Broward County Shore Protection Project, Hollywood/Hallandale Renourishment - March 20, 1990.

Palm Beach County Shore Protection Project, Delray Beach - August 3, 1990.

Palm Beach County Shore Protection Project, Jupiter/Carlin - April 2, 1991.

Palm Beach County Shore Protection Project, Ocean Ridge - May 26, 1994.

Other References.

Campbell, Thomas J., P.E., Robert G. Dean, Sc.D., Norman H. Beumel, and R. Harvey Sasso. 1984. Engineering and economic evaluation of aragonite sand vs offshore borrow material. 24 pp.

Coastal Planning & Engineering, Inc. 1994. Feasibility Study for the use of aragonite sand for beach renourishment in Broward County. 57 pp.

Lutz, Peter L., Alexis A. Schulman, and Sarah L. Shaw. 1991. Fisher Island sea turtle project annual report 1991. 51 pp.

Lutz, Peter L., Alexis A. Schulman, and Sarah L. Shaw. 1992. Fisher Island sea turtle project annual report 1992. 49 pp.

Mrosovsky, N. and C. L. Yntema. 1980. Temperature dependence of sexual differentiation in sea turtles: implications for conservation practices. Biological Conservation 18:271-280.

U.S. Army Corps of Engineers. 1995. Environmental Assessment for the second periodic nourishment of Sunny Isles and Miami Beach Segments, Beach Erosion Control and Hurricane Protection Project, Dade County, Florida. 74 pp.

Wanless, Harold R. October 18, 1993. Comparative grain size analyses of an oolitic sand and sands from potential borrow areas in southeast Florida. Arthur V. Strock & Associates, Inc. 19 pp.

September 12, 1995

Planning Division
Environmental Branch

Mr. David Ferrell
U.S. Fish and Wildlife Service
Post Office Box 2676
Vero Beach, Florida 32961-2676

Dear Mr. Ferrell:

I have enclosed a copy of the Scope of Work (SOW) for field investigations needed by your office to prepare a Fish and Wildlife Coordination Report for the Coast of Florida Erosion and Storm Effects Study, Region III. We are currently negotiating this SOW with our contractor.

We plan to complete negotiations and issue a Notice to Proceed (NTP) by the end of this month. A final report is expected within 105 days of the NTP (see paragraph 8 of the SOW).

If you have any questions or comments, please contact Mr. Mike Dupes of my staff at 904-232-1689 or fax to 904-232-3442.

Sincerely,

A. J. Salem
Chief, Planning Division

Enclosures

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, Maryland 20910

AUG 25 1995

Colonel James H. Simms, USA
Acting Commander
South Atlantic Division, Corps of Engineers
Room 313, 77 Forsyth St., S.W.
Atlanta, Georgia 30335-6801

Dear Colonel Simms:

Enclosed is the biological opinion that concludes formal Endangered Species Act Section 7 consultation on hopper dredging of channels and beach nourishment activities in the southeastern United States from North Carolina through Florida East Coast. The National Marine Fisheries Service (NMFS) concurs with COE findings that dredging windows and further development of the rigid draghead deflector reduces the effects of hopper dredging on sea turtle species, while allowing dredging to continue. As you know, this consultation supersedes a previous regional opinion issued to the COE South Atlantic Division (SAD) on channel dredging in which NMFS found that continued hopper dredging activity in southeast channels along the Atlantic Coast was likely to jeopardize the continued existence of the Kemp's ridley sea turtle (November 25, 1991). The reasonable and prudent alternative issued with the 1991 opinion included the prohibition of hopper dredging in the Canaveral channel, seasonal restrictions which allowed hopper dredging from December through March in channels from North Carolina through Canaveral, or use of other dredges in all southeastern U.S. channels. Since the implementation of this alternative in the winter of 1991, only 14 takes of sea turtles, including three live turtles, have been documented on board hopper dredges in channels along the southeastern U.S. Atlantic Coast.

The Incidental Take Statement, reasonable and prudent measures, and conservation recommendations listed in the enclosed opinion have been discussed with the COE's SAD staff. Of note, hopper dredging windows are modified from the windows established in 1991 and observer requirements have been expanded to incorporate beach nourishment activities. The continued deployment of observers, and participation in the Right Whale Early Warning System, are also listed requirements within this biological opinion. Please note that the authorization for this incidental take expires August 5, 2000. In addition, consultation must be reinitiated when 75% of the authorized incidental take is reached.

Hopper dredging in Cape Canaveral, Florida is not considered under this consultation since turtle concentrations in Canaveral remain high year-round. Projects requiring the use of a hopper dredge in Canaveral will require further, project-specific, consultation.

Much of the new information considered in the enclosed opinion was the result of extensive research efforts recently concluded by COE in six southeast channels: Morehead City Harbor entrance channel, Charleston Harbor entrance channel, Savannah Harbor entrance channel, Brunswick Harbor entrance channel, Fernandina Harbor-St. Marys River entrance channel, and the Canaveral Harbor entrance channel. The results of this research support some modifications to previous seasonal restrictions for hopper dredging in these channels. Additionally, a draghead deflector has been developed that has shown promising results during preliminary tests and field application.

Through an extensive sea turtle research program and participation on the Right Whale Recovery Plan Implementation Team, the COE's SAD has become a leader among Federal action agencies in the southeast region in endangered species research and conservation. We look forward to continued cooperative efforts with your division.

Sincerely,

William W. Fox, Jr., Ph.D.
Director
Office of Protected Resources

Enclosure

cc: ACOE Charleston District, Col. George Hazel
Wilmington District, Col. Robert Sperperg
Savannah District, William Bailey
Jacksonville District, A. J. Salem
F/SE013 - Oravetz

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, Maryland 20910

Endangered Species Act - Section 7 Consultation

Biological Opinion

Agency: U.S. Army Corps of Engineers, South Atlantic Division

Activity: Hopper dredging of channels and beach nourishment activities in the Southeastern United States from North Carolina through Florida East Coast

Consultation Conducted By: National Marine Fisheries Service, Southeast Regional Office

Date Issued: August 25, 1995

BACKGROUND

The U.S. Army Corps of Engineers (COE) has primary responsibility for maintaining navigational channels in U.S. waters. To accomplish this task, dredging is periodically required. A variety of dredge types and techniques are employed on a channel-specific basis, dependent upon the characteristics of channels, availability of disposal sites, local environmental regulations, types of material to be removed, proposed timing of the dredging, etc. In the southeastern United States, at least three types of dredges (hopper dredges, clamshell dredges, and pipeline dredges) are commonly used.

In addition, Congress has mandated that the COE provide periodic beach nourishment to certain beaches in the southeastern U.S. that suffer severe erosion rates. Nourishment activities consist of dredging coarse high-quality sand from offshore borrow areas then pumping the material onshore.

A formal consultation conducted on dredging and beach nourishment operations from North Carolina through Cape Canaveral, Florida, in 1991, and incorporated by reference, concluded that clamshell and pipeline dredges were not likely to adversely affect listed species. There is no new information to change the basis for

that finding. Lethal takes of sea turtles by hopper dredges have been documented, however, and consultations on takes have been conducted since 1980.

Previous Consultations

Consultation on the effects of hopper dredging in the Canaveral ship channel was initiated in August 1978, after NMFS trawl surveys verified reports of high turtle abundance in the channel. On March 30, 1979, NMFS issued a biological opinion based on a threshold examination of the situation. This opinion concluded that insufficient information existed to determine whether or not dredging was likely to jeopardize the continued existence of sea turtles. Through agreement with the COE and the U.S. Navy, trawl surveys were implemented to further assess turtle abundance and distribution in the channel.

On January 22, 1980, the National Marine Fisheries Service (NMFS) issued a biological opinion concluding that "dredging may result in the loss of large numbers of loggerhead sea turtles but is not likely to result in jeopardizing either the loggerhead or Atlantic ridley sea turtle stocks." This opinion recommended that NMFS-approved observers be placed aboard hopper dredges in the Canaveral channel to monitor turtle take, and that dredging be restricted to the period of August 1 through November 1. No evidence of turtle take by hopper dredges existed at this point, but the potential for take was recognized.

A total of 71 turtle takes by hopper dredges were documented in the Canaveral channel over the period of July 11 through November 13, 1980. These takes were considered minimum estimates of mortality due to restrictions inherent in observing turtles within the dredged material. From 1980 through 1986, NMFS, the COE, and the U.S. Navy continued efforts to reduce or eliminate turtle take by hopper dredges in the Canaveral entrance channel. Efforts included attempts to scare turtles out of the channel, detect and capture turtles, remove and relocate turtles, and deflect turtles from the draghead. No acceptable means of eliminating the take of sea turtles by hopper dredges was identified, and take of sea turtles continued.

Trawl surveys of five east coast channels, conducted during 1981 and 1982 (Butler et al., 1987), indicated that these channels did

not contain sea turtles at abundances approaching those observed in Canaveral. One or two turtles were collected in each of the surveyed channels, while hundreds were caught in the Canaveral channel. Because NMFS had no information to suggest that turtle takes in other channels was significant, additional channel surveys were not required, and the Canaveral hopper dredging project was treated as a unique problem.

In 1986, the U.S. Navy reinitiated Endangered Species Act (ESA) Section 7 consultation on Kings Bay, Georgia, channel dredging. The scope of the project involved widening and deepening existing channels and extension of the channel approximately 14 miles. The Navy proposed to implement sea turtle conservation measures including observer coverage, screening of the dredge, and a stand-by trawler to catch and remove turtles, if necessary. From July 1987 through December 1989, a total of 21 turtles were taken during hopper dredging operations in the Kings Bay project.

Turtle take by hopper dredges in Kings Bay resulted in major changes in NMFS policy on channel dredging. This was the first documented take of turtles by hopper dredges anywhere other than in the Canaveral channel. Additionally, while takes in Canaveral were confined to loggerhead turtles, Kings Bay takes included three endangered Kemp's ridley turtles and three endangered green turtles. NMFS began to consider the additive consequences of hopper dredging along the southeast coast.

The Jacksonville District COE and the COE Waterways Experiment Station jointly sponsored a May 11-12, 1988, "National Workshop on Methods to Minimize Dredging Impacts on Sea Turtles," held in Jacksonville, Florida. This workshop brought together representatives of the COE, NMFS, the U.S. Navy, the dredging industry and the environmental community to discuss the dredging/sea turtle conflict. In a July 8, 1988, letter from the Assistant Administrator for Fisheries to the Acting Commander of the COE, NMFS applauded the COE efforts in sponsoring the workshop and advised the COE of agency plans to assess the cumulative impacts to sea turtles of dredging in channels other than Canaveral. Formal consultation was requested for all areas in which hopper dredging was proposed, and observers were required on 25-100 percent of all hopper dredging activities in Brunswick, Savannah, and Wilmington Harbor dredging projects.

Consultation was reinitiated in 1991 in response to the high levels of turtle takes observed, as well as nearby strandings of crushed turtles, during hopper dredging in Brunswick and Savannah channels. The biological opinion, issued November 25, 1991, found that continued unrestricted hopper dredging in channels along the southeast region's Atlantic coast could jeopardize the continued existence of listed sea turtles. A reasonable and prudent alternative was given which included the prohibition of hopper dredging in the Canaveral channel, seasonal restrictions which allowed hopper dredging from December through March in channels from North Carolina through Canaveral, or use of alternative dredges in all southeastern U.S. channels.

The reasonable and prudent alternative issued in the 1991 biological opinion has proven very effective in reducing sea turtle captures. Since the implementation of the measures of the 1991 biological opinion, only 14 takes of sea turtles, including three live turtles, have been documented on board hopper dredges in channels along the southeastern U.S. Atlantic coast.

The COE has recently concluded extensive research in six southeast channels: Morehead City Harbor entrance channel, Charleston Harbor entrance channel, Savannah Harbor entrance channel, Brunswick Harbor entrance channel, Fernandina Harbor - St. Marys River entrance channel, and the Canaveral Harbor entrance channel. Seasonal restrictions were supported by the research; however, refinements in the restrictions due to new, more precise information were requested in the COE request for a new consultation, dated November 8, 1994. Additionally, a draghead deflector has been developed that has shown promising results in preliminary tests.

PROPOSED ACTIVITY

This consultation addresses COE channel dredging activities along the southeastern Atlantic seaboard from North Carolina through Key West, Florida (see Figure 1 from COE's Biological Assessment submitted November 8, 1994). This includes maintenance dredging, new construction dredging, and beach nourishment activities. A summary of major channel dredging projects in which hopper dredges are normally used include: Oregon Inlet, Morehead City, and Wilmington Harbor in North Carolina; Charleston and Port

Royal in South Carolina; Savannah, Brunswick, and Fernandina-St. Marys in Georgia (King's Bay); Jacksonville, St. Augustine, Ponce Inlet, Canaveral, West Palm Beach, and Miami in Florida.

Information on the timing and amount of materials removed during past hopper dredging projects in these channels was provided in the Biological Assessment (COE, November 8, 1994). Generally, the COE has asked that channel hopper dredging windows specified in the 1991 biological opinion be modified from no hopper dredging in Canaveral and dredging in other regional channels from December through March to:

HOPPER DREDGING IN SOUTH ATLANTIC DIVISION

LOCATION	HOPPER DREDGING WINDOW[1]	INCIDENTAL TAKE MONITORING[2]
North Carolina to Pawles Island, S.C.	Year Round	1 May - 1 Nov
Pawles Island, S.C. to Tybee Island, Ga.	1 Nov - 31 May	1 Nov - 1 Jan 1 Apr - 31 May
Tybee Island, Ga. to Titusville, Fla.	15 Dec - 1 May	15 Dec - 1 Jan 15 Mar - 1 May
Titusville, Fla. to Key West, Fla.	Year Round[3]	Year Round

1 Applies to all hopper dredging along South Atlantic Coast. Use of sea turtle deflecting draghead is required unless waiver is granted by CESAD.

2 For navigation projects this requires inflow screens and NMFS approved observers. For beach nourishment projects this can be accomplished by either monitoring the beach or use of observers and screens on the hopper dredge.

3 Use of hopper dredging at Canaveral Navigation Channel will be restricted to those times when there is an urgent need for this type of equipment.